UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/300,482	04/28/99	CHEIKH	N 04983.0031.U

022930 HM22/1220
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EXAMINER	
ZEMAN, M	
ART UNIT	**PAPER NUMBER**
1631	8

DATE MAILED: 12/20/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/300,482	Applicant(s) CHEIKH ET AL.	
	Examiner Mary Zeman	Art Unit 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) *3-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 2* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claims *1-9* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892) ✓

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *31/2*.

18) ☐ Interview Summary (PTO-413) Paper No(s). _____.

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other:

DETAILED ACTION

Applicant's election with traverse of Group I, claims 1 and 2, in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the restriction is improper as it would not be a burden to search all of the inventions, and that the restrictions between certain groups should not be made. This is not found persuasive because each patentably distinct invention was clearly set forth in the restriction requirement. For example, the restriction between group I and V is proper, because the nucleotides of Group I can be used in materially differing methods from those of Group V, and also, the methods of group V require additional search and consideration duties not necessarily required for the compositions of Group I.

The requirement is still deemed proper and is therefore made FINAL.

Applicant's further election with traverse of SEQ ID NO: 1, 4, 14, 27, 225, 298, 311, 356, 569 and 619 in Paper No. 7 is acknowledged. The traversal is on the ground(s) that a search of all 699 sequences present in the application would not pose an undue burden upon the examiner, and that the sequences should all be searched together in view of an unexplained relatedness. This is not found persuasive because the Office has determined, as explained in MPEP 803.04, that ten sequences is the maximum number of sequences which is reasonable for the Office to search and properly examine. Further, the only inter-relatedness between the sequences the Examiner can identify is that they are all from one organism. This is not a valid assertion of inter-relatedness, because each sequence appears to be related to a differing gene or DNA segment, and as such, are considered to be unrelated.

The requirement is still deemed proper and is therefore made FINAL.

Claims 3-9 and all non-elected sequences are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 7.

Priority

Applicant's claim for priority under 35 USC 119(e) to provisional application number 60/083,390, filed 4/29/98, is acknowledged. It is noted that the CRF filed with this provisional

application was defective and not entered into the office database, such that it is impossible to search and identify the disclosure of any one specific sequence in that application.

Information Disclosure Statement

The IDS, filed 9/29/99, has been fully considered. An initialed copy of the PTO-1449 is enclosed with this Action.

Specification

The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01. (See for example, page 9 lines 9 and 11, page 56, lines 7-8, etc..)

35 U.S.C. 101/112 Utility Rejections

35 U.S.C. 101 reads as follows:

> "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".

Definitions: [from REVISED INTERIM UTILITY GUIDELINES TRAINING MATERIALS; repeated from http://www.uspto.gov/web/menu/utility.pdf]

> "Credible Utility" - Where an applicant has specifically asserted that an invention has a particular utility, that assertion cannot simply be dismissed by Office personnel as being "wrong". Rather, Office personnel must determine if the assertion of utility is credible (i.e., whether the assertion of utility is believable to a person of ordinary skill in the art based on the totality of evidence and reasoning provided). An assertion is credible unless (A) the logic underlying the assertion is seriously flawed, or (B) the facts upon which the assertion is based is inconsistent with the logic underlying the assertion. Credibility as used in this context refers to the reliability of the statement based on the logic and facts that are offered by the applicant to support the assertion of utility. A *credible* utility is assessed from the standpoint of whether a person of ordinary skill in the art would accept that the recited or disclosed invention is currently available for such use. For example, no perpetual motion machines would be considered to be currently available. However, nucleic acids could be used as probes, chromosome markers, or forensic or diagnostic markers. Therefore, the credibility of such an assertion would not

be questioned, although such a use might fail the *specific* and *substantial* tests (see below).

"Specific Utility" - A utility that is *specific* to the subject matter claimed. This contrasts with a *general* utility that would be applicable to the broad class of the invention. For example, a claim to a polynucleotide whose use is disclosed simply as a "gene probe" or "chromosome marker" would not be considered to be *specific* in the absence of a disclosure of a specific DNA target. Similarly, a general statement of diagnostic utility, such as diagnosing an unspecified disease, would ordinarily be insufficient absent a disclosure of what condition can be diagnosed.

"Substantial utility" - a utility that defines a "real world" use. Utilities that require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use are not substantial utilities. For example, both a therapeutic method of treating a known or newly discovered disease and an assay method for identifying compounds that themselves have a "substantial utility" define a "real world" context of use. An assay that measures the presence of a material which has a stated correlation to a predisposition to the onset of a particular disease condition would also define a "real world" context of use in identifying potential candidates for preventive measures or further monitoring. On the other hand, the following are examples of situations that require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use and, therefore, do not define "substantial utilities":

A. Basic research such as studying the properties of the claimed product itself or the mechanisms in which the material is involved.

B. A method of treating an unspecified disease or condition. (Note, this is in contrast to the general rule that treatments of specific diseases or conditions meet the criteria of 35 U.S.C. 101.)

C. A Method of assaying for or identifying a material that itself has no "specific and/or substantial utility".

D. A method of making a material that itself has no specific, substantial, and credible utility.

E. A claim to an intermediate product for use in making a final product that has no specific, substantial, and credible utility.

Note that "throw away" utilities do not meet the tests for a *specific* or *substantial* utility. For example, using transgenic mice as snake food is a utility that is neither specific (all mice could function as snake food) nor substantial (using a mouse costing tens of thousands of dollars to produce as snake food is not a "real world" context of use). Similarly, use of any protein as an animal food supplement or a shampoo ingredient are "throw away" utilities that would not pass muster as specific or substantial utilities under 35 U.S.C. ' 101. This analysis should, or course, be tempered by consideration of the context and nature of the invention. For example, it a transgenic mouse was generated with the specific provision of an enhanced nutrient profile, and disclosed for use as an

animal food, then the test for specific and substantial *asserted* utility would be considered to be met.

"Well established utility" - a specific, substantial, and credible utility which is well known, immediately apparent, or implied by the specification's disclosure of the properties of a material, alone or taken with the knowledge of one skilled in the art. "Well established utility" does not encompass any "throw away" utility that one can dream up for an invention or a nonspecific utility that would apply to virtually every member of a general class of materials, such as proteins or DNA. If this is the case, any product or apparatus, including perpetual motion machines, would have a "well established utility" as landfill, an amusement device, a toy, or a paper weight; any carbon containing molecule would have a "well established utility" as a fuel since it can be burned; any protein would have well established utility as a protein supplement for animal food. This is not the intention of the statute.

See also the MPEP at 2107 - 2107.02.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-2 are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility due to its not being supported by either specific and/or substantial utility or a well established utility.

The claimed nucleic acids are not supported by a specific asserted utility because the disclosed use(s) of the nucleic acid(s) are not specific and are generally applicable to any nucleic acid. The specification states that the nucleic acid compounds may be useful as probes for assisting in the isolation of full-length cDNAs or genes which would be used to make protein and optionally further usage to make the corresponding antibodies, gene mapping, isolation of homologous sequences, detection of gene expression such as in Northern blot analysis, molecular weight markers, chromosomal markers, and for numerous other generic genetic engineering usages. Similarly, protein may be used for detection of expression, antibody production, Western blots, etc. These are non-specific uses that are applicable to nucleic acid(s) and/or proteins in general and not particular or specific to the nucleic acid(s) being claimed.

Further, the claimed nucleic acids are not supported by a substantial utility because no substantial utility has been established for the claimed subject matter. For example, a nucleic acid may be utilized to obtain a protein. The protein could then be used in conducting research to functionally characterize the protein. The need for such research clearly indicates that the protein and/or its function is not disclosed as to a currently available or substantial utility. A starting material that can only be used to produce a final product does not have substantial asserted utility in those instances where the final product is not supported by a specific and substantial utility. In this case none of the proteins that are to be produced as final products resulting from processes involving claimed nucleic acid have asserted or identified specific and substantial utilities. The research contemplated by applicant(s) to characterize potential protein products, especially their biological activities, does not constitute a specific and substantial utility. Identifying and studying the properties of a protein itself or the mechanisms in which the protein is involved does not define a "real world" context or use. Similarly, the other listed and asserted utilities as summarized above or in the instant specification are neither substantial nor specific due to being generic in nature and applicable to a myriad of such compounds. Note, because the claimed invention is not supported by a specific and substantial asserted utility for the reasons set forth above, credibility has not been assessed. Neither the specification as filed nor any art of record discloses or suggests any property or activity for the nucleic acid and/or protein compound(s) such that another non-asserted utility would be well established for the compounds.

It is noted that applicant(s) have listed a number of sequences which are known in the prior art and which has a high percentage sequence similarity to a claimed sequence. Absent factual evidence, a percentage sequence similarity of less than 100 % is not deemed to reasonably support to one skilled in the art whether the biochemical activity of the claimed subject matter would be the same as that of such a similar known biomolecule. It is known for nucleic acids as well as proteins, for example, that even a single nucleotide or amino acid change or mutation can destroy the function of the biomolecule in many instances, albeit not in all cases. The effects of these changes are largely unpredictable as to which ones have a significant effect versus not. Therefore, the citation of sequence similarity results in an unpredictable and therefore unreliable correspondence between the claimed biomolecule and the indicated similar

biomolecule of known function and therefore lacks support regarding utility and/or enablement. Several publications document this unpredictability of the relationship between sequence and function, albeit that certain specific sequences may be found to be conserved over biomolecules of related function upon a significant amount of further research. See the following publications that support this unpredictability as well as noting certain conserved sequences in limited specific cases: Attwood, T. [Science Vol. 290, Pages 471-473, (Oct. 2000)]; Gerhold et al.[BioEssays, Volume 18, Number 12, pages 973-981{1996)]; Wells et al.[Journal of Leukocyte Biology, Volume 61, Number 5, pages 545-550 (1997)]; and Russell et al.[Journal of Molecular Biology, Volume 244, pages 332-350 (1994)].

Claims 1-2 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art would not know how to use the claimed invention.

35 U.S.C. 112, Written Description Rejection

Claims 1 and 2 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification discloses SEQ ID NO: 1, 4, 14, 27, 225, 298, 311, 356, 569 and 619 which corresponds to the cDNA asserted to encode the maize or soybean species of various enzymes. Claims drawn to isolated polynucleotides consisting of any one of SEQ ID NO: 1, 4, 14, 27, 225, 298, 311, 356, 569 and 619 would meet the written description and enablement provisions of 35 USC 112, first paragraph. However, claims 1 and 2 are directed to encompass gene sequences (genomic DNA comprising introns, exons, etc.), sequences that hybridize to SEQ ID NO: 1, 4, 14, 27, 225, 298, 311, 356, 569 and 619, corresponding sequences from other species, mutated sequences, allelic variants, splice variants, sequences that have a recited degree of identity (similarity, homology), fragments, and so forth. None of these sequences meet the

written description provision of 35 USC 112, first paragraph. The specification provides insufficient written description to support the genus encompassed by the claim.

Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention.* The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed.*" (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116.)

With the exception of SEQ ID NO: 1, 4, 14, 27, 225, 298, 311, 356, 569 and 619, the skilled artisan cannot envision the detailed chemical structure of the encompassed polynucleotides and/or proteins, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it. The nucleic acid itself is required. See Fiers v. Revel, 25 USPQ2d 1601, 1606 (CAFC 1993) and Amgen Inc. V. Chugai Pharmacentical Co. Ltd., 18 USPQ2d 1016. In Fiddes v. Baird, 30 USPQ2d 1481, 1483, claims directed to mammalian FGF's were found unpatentable due to lack of written description for the broad class. The specification provided only the bovine sequence.

Finally, University of California v. Eli Lilly and Co., 43 USPQ2d 1398, 1404, 1405 held that:

> ...To fulfill the written description requirement, a patent specification must describe an invention and do so in sufficient detail that one skilled in the art can clearly conclude that "the inventor invented the claimed invention." *Lockwood v. American Airlines, Inc.* , 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (1997); *In re Gosteli* , 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) (" [T]he description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed."). Thus, an applicant complies with the written description requirement "by describing the invention, with all its claimed limitations, not that which makes it obvious," and by using "such descriptive means as words, structures, figures, diagrams, formulas, etc., that set forth the claimed invention." *Lockwood* , 107 F.3d at 1572, 41 USPQ2d at 1966.
>
> An adequate written description of a DNA, such as the cDNA of the recombinant plasmids and microorganisms of the '525 patent, "requires a precise definition, such as by structure, formula, chemical name, or physical properties," not a mere wish or plan for obtaining the claimed chemical invention. *Fiers v. Revel* , 984 F.2d 1164, 1171,

> 25 USPQ2d 1601, 1606 (Fed. Cir. 1993). Accordingly, "an adequate written description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it; what is required is a description of the DNA itself." Id. at 1170, 25 USPQ2d at 1606.
>
> The name cDNA is not itself a written description of that DNA; it conveys no distinguishing information concerning its identity. While the example provides a process for obtaining human insulin-encoding cDNA, there is no further information in the patent pertaining to that cDNA's relevant structural or physical characteristics; in other words, it thus does not describe human insulin cDNA. Describing a method of preparing a cDNA or even describing the protein that the cDNA encodes, as the example does, does not necessarily describe the cDNA itself. No sequence information indicating which nucleotides constitute human cDNA appears in the patent, as appears for rat cDNA in Example 5 of the patent. Accordingly, the specification does not provide a written description of the invention of claim 5.

Therefore, only SEQ ID NO: 1, 4, 14, 27, 225, 298, 311, 356, 569 and 619 but not the full breadth of the claims meet the written description provision of 35 USC 112, first paragraph. The species specifically disclosed are not representative of the genus because the genus is highly variant. Applicant is reminded that Vas-Cath makes clear that the written description provision of 35 USC 112 is severable from its enablement provision. (See page 1115.)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The metes and bounds of claims 1 and 2 are unclear. Both claims recite the term "or a fragment thereof" in reference to a polynucleotide which purportedly encodes an enzyme. The limits of the term "fragment thereof" are unclear, as a single amino acid could be considered a fragment. Further, how large much a polynucleotide fragment sequence be to be identified as encoding a particular enzyme? Is the fragment required to have enzymatic activity?

Further in claims 1 and 2, several of the species recite "putative" enzymes. What is a "putative" enzyme, and how is one identified? Is this a sequence solely identified through

homology with known sequences? What else could the sequence be, if not the "putative enzyme"? This term is confusing as to what it intends to encompass.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 2 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims drawn to polynucleotides of copending Application No. 09/304,517. Although the conflicting claims are not identical, they are not patentably distinct from each other because SEQ ID NO: 66502 of the '517 application appears to encode the same enzyme as SEQ ID NO: 1 of the instant application. SEQ ID NO: 181981 of the '517 application is identical to SEQ ID NO: 27 of the instant application. SEQ ID NO: 144724 of the '517 application is identical to SEQ ID NO: 4 of the instant application. SEQ ID NO: 191792 of the '517 application would appear to encode at least a fragment of the same enzyme as SEQ ID NO: 4 of the instant application. SEQ ID NO: 84490 of the '517 application is identical to SEQ ID NO: 14 of the instant application. SEQ ID NO: 5431 of the '517 application is identical to SEQ ID NO: 225 of the instant application. SEQ ID NO: 240905 of the '517 application is identical to SEQ ID NO: 298 of the instant application. SEQ ID NO: 2965 of the '517 application is identical to SEQ ID NO: 311 of the instant application. SEQ ID NO: 233016 of the '517 application appears to encode the same enzyme as SEQ ID NO: 311 of the instant application. SEQ ID NO: 175329 and 241028 of the '517 application appear to encode the same enzymes as SEQ ID NO: 569 of the instant application.

SEQ ID NO: 10554 of the '517 application is identical to SEQ ID NO 619 of the instant application. The '517 application and the instant application have at least two inventors in common. It is unclear if these sequences have been elected for examination in the '517 application. An indication from Applicant as to the elected sequences in the '517 application could overcome this rejection..

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1-2 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims drawn to polynucleotides of copending Application No. 09/262,979. Although the conflicting claims are not identical, they are not patentably distinct from each other because the encompassed sequences are the same or equivalent as they would appear to encode the same enzymes as required by claim 1. For example, SEQ ID NO: 4513 of the '979 application is identical to SEQ ID NO: 356 of the instant application. SEQ ID NO: 4776 of the '979 application is identical to SEQ ID NO: 311 of the instant application. SEQ ID NO: 4775 of the '979 application would appear to encode the same enzyme as that of SEQ ID NO: 311. SEQ ID NO: 4761 of the '979 application is identical to SEQ ID NO: 298 of the instant application. SEQ ID NO: 4688 of the '979 application is identical to SEQ ID NO: 225 of the instant application. It is unclear whether these sequences are under examination in the '979 application. These two applications have at least two inventors in common. An indication from Applicant as to whether these sequences are under examination in the '979 application could obviate this rejection.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

In view of the large number of applications in the PTO that may have one (or more) inventor in common, or a common assignee, Applicant is requested to provide information as to any other potentially conflicting applications, or applications sharing subject matter such that any double patenting issues can be properly assessed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

As set forth above, it is impossible to search the priority application sequence listing for the disclosure of any single polynucleotide sequence. Therefore, priority to the filing date of that provisional is denied, and the instant claims are awarded the effective filing date of 4/28/99. If Applicant desires priority to the provisional application filing date, the specific page and line number of the disclosure of each specific sequence is required.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by AB007907.

Claim 1 is drawn to an isolated polynucleotide that encodes one of a variety of enzymes, or a fragment thereof.

AB007907 (GenEMBL Database Record, 15 October 1997) is a disclosure of a mRNA/ cDNA sequence for a 6-phosphogluconate dehydrogenase enzyme of soybeans. This disclosure meets the limitations of the enzymes recited as (b) and (c) in claim 1. AB007907 has some sequence homology with SEQ ID NO: 27.

Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by AF037030.

AF037030 (GenEMBL Database Record, 26 November 1998) is a disclosure of a mRNA/ cDNA sequence for a 6-phosphogluconate dehydrogenase enzyme of maize. This disclosure meets the limitations of the enzymes recited as (b) and (c) in claim 1. AF037030 has significant sequence homology with SEQ ID NO: 14.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Katsurada (1997).

Katsurada (Tezukayama-Gakuin Junior College Annual Report of Scientific Studies, 1997, No. 45, pages 58-73 [Abstract only]) discloses the cloning and sequencing of glucose-6-phosphate dehydrogenase of soybean. This meets limitation (a) of claim 1.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Katsurada (1996).

Katsurada (Tezukayama-Gakuin Junior College Annual Report of Scientific Studies, 1996, No. 44, pages 89-104 [Abstract only]) discloses the cloning and sequencing of 6-phosphogluconate dehydrogenase of soybean. This meets limitations (b-c) of claim 1.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Lal et al..

Lal et al. (Lal et al. Plant Physiology (1995) Vol 108, No 3, Pg 1295-1296) discloses the cloning and sequencing of glucose-6-phosphate isomerase, (which is an alternate name for phosphoglucoisomerase) of maize. This meets limitation (k) of claim 1.

Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by AAC27702 (PTO-1449, Redinbaugh et al. 02 October 1998).

AAC27702 (Redinbaugh et al. Entrez, 02 October 1998) is a disclosure of a mRNA/ cDNA sequence for a 6-phosphogluconate dehydrogenase enzyme of maize. This disclosure meets the limitations of the enzymes recited as (b) and (c) in claim 1.

Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by AF061837 (PTO-1449, Redinbaugh et al. 29 July 1998).

AF061837 (Redinbaugh et al. Entrez, 29 July 1998) is a disclosure of a mRNA/ cDNA sequence for a 6-phosphogluconate dehydrogenase enzyme of maize. This disclosure meets the limitations of the enzymes recited as (b) and (c) in claim 1.

Conclusion

No claim is allowed.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. DeLencastre et al. USP 6,030,807 discloses a gene for L-ribulose-5-phosphate-4-epimerase of *Bacillus subtilis*.

Pictaggio et al. USP 5,726,053 discloses genes for transaldolase and transketolase from *Zymomonas mobilis*.

Schmidt et al. USP 5,912,169 discloses plant transketolase polypeptides and polynucleotides, specifically from tobacco leaves.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary K Zeman whose telephone number is (703) 305-7133. The examiner can be reached between the hours of 7:30 am and 5:00 pm Monday through Thursday, and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, can be reached at (703) 308 4028.

The fax number for this Art Unit is (703) 305-7401.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center receptionist whose telephone number is (703) 308-0196.

Mary K Zeman
Examiner, 1631

mkz
November 21, 2000